

What is claimed is:

1. A method of manufacturing an electronic circuit module comprising:

5        flow soldering which comprises preheating an interconnect substrate on which an electronic part is placed, and supplying molten solder to a first surface of the interconnect substrate, whereby the first surface is heated to a specific temperature,

10        wherein the interconnect substrate is heated by the preheating so that a difference between a temperature of the first surface immediately before supplying the molten solder and the specific temperature at the time of supplying the molten solder is 100°C or less.

15        2. The method of manufacturing an electronic circuit module as defined in claim 1,

      wherein the interconnect substrate is heated by the preheating so that a difference between a temperature of the  
20 first surface immediately before supplying the molten solder and the specific temperature at the time of supplying the molten solder is 20°C or less.

3. The method of manufacturing an electronic circuit module as  
25 defined in claim 1,

      wherein a temperature increase rate  $\alpha$  of the first surface of the interconnect substrate during the preheating is

$$0 < \alpha \leq 125 \text{ (}^{\circ}\text{C/sec)}.$$

4. The method of manufacturing an electronic circuit module as defined in claim 1,

5 wherein the interconnect substrate is heated using at least either a hot blast or radiant heat during the preheating.

5. The method of manufacturing an electronic circuit module as defined in claim 1, further comprising:

10 heating a second surface of the interconnect substrate in the step of supplying the molten solder.

6. The method of manufacturing an electronic circuit module as defined in claim 5,

15 wherein the interconnect substrate is heated so that a difference between a temperature of the first surface of the interconnect substrate and the temperature of the second surface of the interconnect substrate is 140°C or less.

20 7. The method of manufacturing an electronic circuit module as defined in claim 1,

wherein the temperature of the interconnect substrate is detected and a heating temperature of the interconnect substrate is controlled based on a detected result.

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8. The method of manufacturing an electronic circuit module as defined in claim 6,

wherein the temperature of the second surface of the interconnect substrate is detected while the temperature of the first surface of the interconnect substrate is detected and a heating temperature of the interconnect substrate is controlled based on a value obtained by comparing detected results of both surfaces.

9. A method of manufacturing a semiconductor module comprising:

10 the method of manufacturing an electronic circuit module as defined in claim 1,

wherein the electronic part is a semiconductor device.

10. An apparatus of manufacturing an electronic circuit module comprising:

a preheating section which includes a heater for heating an interconnect substrate on which an electronic part is placed, and

20 a solder supplying section which supplies molten solder to a first surface of the interconnect substrate, whereby the first surface is heated to a specific temperature,

wherein the heater heats the interconnect substrate so that a difference between a temperature of the first surface immediately before supplying the molten solder and the specific temperature at a time of supplying the molten solder is 100°C or less.

11. The apparatus of manufacturing an electronic circuit module as defined in claim 10,

wherein the heater heats the interconnect substrate so that a difference between a temperature of the first surface immediately before supplying the molten solder and the specific temperature at a time of supplying the molten solder is 20°C or less.

12. The apparatus of manufacturing an electronic circuit module as defined in claim 10,

wherein the heater is disposed at least on a side of the first surface of the interconnect substrate,

wherein the temperature increase rate  $\alpha$  of the first surface of the interconnect substrate is

$0 < \alpha \leq 125$  (°C/sec).

13. The apparatus of manufacturing an electronic circuit module as defined in claim 10,

wherein the heater is a sheath heater.

14. The apparatus of manufacturing an electronic circuit module as defined in claim 10,

wherein the heater is a far infrared heater.

15. The apparatus of manufacturing an electronic circuit module as defined in claim 10,

wherein the heater is equipped with a fan.

16. The apparatus of manufacturing an electronic circuit module as defined in claim 15,

wherein a blowing section of a hot blast from the heater  
5 is provided on a side of the first surface of the interconnect substrate in the preheating section.

17. The apparatus of manufacturing an electronic circuit module as defined in claim 10,

10 wherein the solder supplying section comprises:

a solder supplying part disposed on a side of the first surface of the interconnect substrate, and

a second heater disposed on a side of a second surface of the interconnect substrate.

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18. The apparatus of manufacturing an electronic circuit module as defined in claim 17,

wherein at least either the heater or the second heater heats the interconnect substrate so that a difference between  
20 a temperature of the first surface of the interconnect substrate and the temperature of the second surface of the interconnect substrate is 140°C or less.

19. The apparatus of manufacturing an electronic circuit  
25 module as defined in claim 17, further comprising:

a sensor which detects a temperature of the interconnect substrate, and

a heater control section which controls the temperature of at least either the heater or the second heater for heating the interconnect substrate based on a result detected by the sensor.

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20. The apparatus of manufacturing an electronic circuit module as defined in claim 18, comprising:

a first sensor which detects the temperature of the first surface of the interconnect substrate,

10 a second sensor which detects the temperature of the second surface of the interconnect substrate, and

a heater control section which controls the temperature of at least either the heater or the second heater for heating the interconnect substrate by comparing detected results of the  
15 first and second sensors.

21. An apparatus of manufacturing a semiconductor module comprising:

the apparatus of manufacturing an electronic circuit  
20 module as defined in claim 10,

wherein the electronic part is a semiconductor device.